The framework for sustainable eDemocracy development

Suree Funilkul and Wichian Chutimaskul
School of Information Technology,
King Mongkut’s University of Technology Thonburi, Bangkok, Thailand

Abstract
Purpose – The aim of this paper is to create the framework for sustainable eDemocracy development which is used as a guideline for building tools for supporting democracy system. To consolidate this framework, the quality model of eDemocracy system is constructed in order to support the efficient and effective eDemocracy.

Design/methodology/approach – This work begins with collecting and analyzing the existing approaches of eDemocracy development, especially the governance development standard called COBIT 4.1. Next, the principles of democracy based on United Nations Information Services and the Bureau of International Information Programs: IIP of the US Department of State’s are studied. To support such principle, the intrinsic eDemocracy applications are explored. In addition, the quality model of an eDemocracy system is built by integrating the concepts of technology acceptance model (TAM) and the eGovernment web quality assessment model (eGovernment WebQAM).

Findings – The 4 + 1 main constructs of eDemocracy development framework is introduced. They are stakeholder and policy, information and communication technology, development methodology containing process management and project management, environment, and eDemocracy components. Such a framework is claimed to support sustainable development. Furthermore, the five basic eDemocracy applications which support democratic principles are illustrated. They are eInformation, eService, eVoting, eComplaint, and eForum. The quality aspects, i.e. knowledge quality, process quality, communication quality and TAM are embedded to consolidate the authors framework.

Research limitations/implications – Most existing approaches of eDemocracy development emphasize different eDemocracy development aspect depending on their interests and constraints. No approaches support all issues related in the fundamental aspects of eDemocracy development. Therefore, a sustainable framework is then created. Additional key aspect that has been embedded to this work is the eDemocracy qualities introduce in order to achieve citizens’ acceptance in eDemocracy development.

Originality/value – This paper presents the framework for sustainable eDemocracy development to support the desirable and workable eDemocracy system. The information system quality and TAM are embedded into the authors framework for building better eDemocracy that meets the citizens’ needs and information technology standard.

Keywords Democracy, Communication technologies, Sustainable development, Modelling, Quality

Paper type Research paper

Introduction
Democracy is a form of administration by citizens. Citizens have sovereign power to administrate the country by themselves or elect the members of parliament to act as their representatives in administration. Democratic citizens must have respect for each other, equal rights, and recognize other people’s opinions. Moreover, the citizens participation in the democratic process has become a major concern because the democratic process is not only regarded as a method of solving social, administrative, and political conflicts, but also defined as the relatively effective decision making (Zarei, 2000).
Nevertheless, the International Institute for Democracy and Electoral Assistance, Sweden (International IDEA, 1995) reported that the number of citizens taking part in voting for their representatives or various leaders in the democratic countries such as USA, UK, and Japan has continuously decreased due to less interested by citizens. In order to indicate the success of eDemocracy development, hence, the persuasion of citizens’ participation and the communication between citizens and the government organizations are necessary (Anderson et al., 2007; Jones et al., 2007).

The coming and rising of information and communication technology (ICT) capability can make democracy more possible and accessible. ICT gives citizens new ways to engage themselves in the democratic process such as information enquiry and service requests through government web sites, expression of citizens’ opinions through forums, and complaint submission to government organizations. ICT is used as a government tool to develop electronic democracy: eDemocracy. Hence, eDemocracy is claimed as an alternative way to support democracy by giving citizen’s participatory power via ICT (Whyte et al., 2005; van der Graaf and Svensson, 2006; Coleman, 2007). Moreover, eDemocracy is considered as a basic and fundamental tool for supporting effective democratic government in this information society (Local E-Democracy National Project, 2005; Timisi, 2007; Bozinis and Iakovou, 2005). However, many eDemocracy developments fail to achieve the above challenges (United Nations, 2005). In addition, the Brundtland Commission Report gives the definition of sustainable development as “the development that meets the current needs” (World Commission on Environment and Development, 1987). This work, therefore, introduces the framework of sustainable eDemocracy development and illustrates its prominence comparing to COBIT 4.1, which is a general framework for eGovernance development. The intrinsic eDemocracy applications and quality aspect of eDemocracy system are also addressed.

Existing approaches for eDemocracy development
The purposes of eDemocracy development are to acquire an eDemocracy system which can be used by citizens and to support the citizens’ participation in the democratic process. The key characteristics of eDemocracy which have been identified by Blumler and Coleman (2001), HM Government (2002), Riley (2002) and Funilkul et al. (2006) are the better service with the appropriate access time, the reasonable cost of utilizing suitable ICT, the responsiveness of government in listening, and the support of citizens’ participation. Consequently, the development of eDemocracy is one of the regulations that must be defined by the government so that its vision, mission, strategy, plan, and policy can be correctly constructed. This leads to the needs to develop a right eDemocracy system that truly meets the government’s needs and provides sufficient citizen participation channels. Some examples of existing approaches for eDemocracy development can be found in Clift (2004), Black and Noble (2001) and Local eDemocracy Projects in UK having eDemocracy project planning route map and eDemocracy positioning project (Project Routemap, 2006; Local E-Democracy National Project, 2006).

The “top ten eDemocracy: to do list” proposed by Clift (2004) helps government start improving the democratic process by the use of ICT. The top ten to do list consists of an in-person online consultation, the development of eDemocracy legislation, eDemocracy sharing, public meetings announcement, eDemocracy access via the governments’ web site, efficient eDemocracy service implementation, ICT funding, the encouragement of citizens’ participation, ICT training, and eDemocracy accessibility.
The critical keys and potential barriers of successful eDemocracy development must be considered. Black and Noble (2001) introduce five components: investment, technological flexibility, access and digital divide, leadership, and privacy and security to support this matter.

In addition, the eDemocracy projects, which are established by Local eDemocracy Projects in UK containing the eDemocracy Project Routemap (2006) and eDemocracy positioning project (Local E-Democracy National Project, 2006), are addressed. The eDemocracy project planning route map comprises 16 stages containing the definition of eDemocracy, project management methodology, project idea, project team, project objective, business case, solution formulation, project plan, risks assessment, project approval, project control, project undertaking, progress analysis, problem management, product approval, and post project implementation review. The eDemocracy positioning project consists of four main steps: the strategy re-assessment, the new skill development, the channels and tools selection, and the implementation and support. These processes aim to put the right eDemocracy tools and channels in place. Moreover, the understanding of the local authorities in adopting eDemocracy and the sustained commitment from councilors and officers in using eDemocracy channels and tools are required in the positioning of eDemocracy projects.

As far as these approaches for eDemocracy developments are concerned, we found that they did not comply with the standard of information system development. For example, the use of standard technology to support the communication and information sharing among government organizations is not considered. The standard methodology, i.e., process management and project management, of eDemocracy development is also absent. Such a methodology is important to support the efficient and effective eDemocracy development to meet the citizens’ needs and satisfaction.

**The standard of information system development**

The standard for the information system development can be considered by information system components: people and data, equipment, and process:

- **People and data standard** is the information system development concentrating on human-computer interaction (HCI), usability, and accessibility. Users must be able to access the information system through various channels. The examples of people and data standards can be found in the International Standard Organization (ISO, 2007). The people standard includes the ISO 13407 standard for HCI and ISO 9241-11 standard for usability. It suggests not only the description of usability, but also accessibility. The data standard contains the ISO 27001 and ISO 17799 for information security management. Such a management leads to data integrity, data confidentiality, and data availability.

- **Equipment standard** is the use of information technology that can be shared among government organizations and can be continually supported by vendors. It must also support various software and operating systems. The concepts of maintainability, portability, and compatibility must be included. An example of the standard of web technology can be found in W3C (2007) standard established by World Wide Web Consortium. This standard aim is to make the most use of web site.

- **Process standard** concerns the development process to gain an effective information system that facilitates the users’ satisfaction and meets their needs.
The process standards of information system development issued by the ISO (2007) are the ISO 15288 and ISO 12207. The former is for the system development life cycle; the latter is for the software development life cycle. Both standards are designed to be used as the guidelines for system development and software development, respectively. The methodologies of an eDemocracy system development can be found in The Committee of Sponsoring Organizations of the Treadway Commission (COSO, 2006) and COBIT 4.1 (IT Governance Institute, 2007). Both methodologies share the same objective of providing guidance and best practice for project management. COSO is the development standard for internal control of both system process and laws and regulations. COBIT 4.1, an open standard for controlling information and related technologies, provides guidance for achieving the effectiveness and efficiency in managing, implementing, and evaluating information technology resources. In addition, COBIT 4.1, a breakthrough governance tool, allows us to understand and manage the risks and benefits associated with information technology resources. For the development of eDemocracy, it is found that no sustainable framework can be used to gain the required quality within reasonable cost and the given time. Our work, therefore, concentrates on the process standard and the use of COBIT 4.1 as a part of sustainable eDemocracy development.

Analyzing eDemocracy development process
The existing processes of eDemocracy development can be found in Clift, Black and Noble, eDemocracy project planning route map, eDemocracy positioning project, and COBIT 4.1. Such processes involve 4 + 1 main components: stakeholder and policy, ICT, methodology, the environment, and eDemocracy system, which will be explained in the next topic. The comparison of existing approaches of eDemocracy development process is given in Table I.

Table I provides the comparison of the existing eDemocracy development approaches. There is no approach that can support basic issues of eDemocracy development. The issue of budgeting is considered by all approaches. However, only the issue of “Provide the commitment among stakeholders” is addressed by the eDemocracy positioning approach. Most issues related to eDemocracy development are considered by COBIT 4.1. Nevertheless, COBIT 4.1 does not emphasize the following issues:

- the commitment among stakeholders;
- the collaboration among government organizations;
- the supportive of multiple languages; and
- the announcement of all agendas of eDemocracy with details of time and venues to citizens before their participation.

Therefore, this work will extend COBIT 4.1 with these issues to propose the framework of sustainable eDemocracy development.

Framework for sustainable eDemocracy development
The framework for sustainable eDemocracy development, which is designed to fulfill the features of COBIT 4.1, comprises 4 + 1 components as shown in Figure 1.
## Table I. Analyzing eDemocracy development process

<table>
<thead>
<tr>
<th>Components</th>
<th>eDemocracy Development Process</th>
<th>Approaches Project route map</th>
<th>eDemocracy positioning</th>
<th>COBIT 4.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stakeholder and policy</td>
<td>Set up the strategy and policy of eDemocracy development</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Procure IT resources</td>
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<td>X</td>
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<tr>
<td></td>
<td>Define third-party services management</td>
<td></td>
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<td>X</td>
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<tr>
<td></td>
<td>Declare personnel with duty and responsibility</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Provide the commitment among stakeholders</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>The ICT</td>
<td>Determine technological direction, channels, and tools for participation within budget</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Acquire and maintain technology infrastructure</td>
<td></td>
<td></td>
<td>X</td>
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<tr>
<td><strong>The methodology</strong></td>
<td><strong>Process management</strong></td>
<td></td>
<td></td>
<td>X</td>
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<tr>
<td></td>
<td>Acquire, monitor, evaluate, and maintain eDemocracy system in line with citizens’ requirements</td>
<td></td>
<td></td>
<td>X</td>
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<tr>
<td></td>
<td>Ensure continuous services by designing an easy-to-use eDemocracy system</td>
<td></td>
<td>X</td>
<td>X</td>
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<tr>
<td></td>
<td>Define the information architecture</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Identify solutions and feasibility study</td>
<td></td>
<td></td>
<td>X</td>
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<tr>
<td></td>
<td>Give a smooth system operation</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Install and accredit solutions and changes</td>
<td></td>
<td>X</td>
<td>X</td>
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<td></td>
<td>Organize types of services</td>
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<td></td>
<td>Manage the configuration</td>
<td></td>
<td></td>
<td>X</td>
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<tr>
<td></td>
<td>Provide practice to government officers, educate and train citizens in using eDemocracy system</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Project management</td>
<td>Allocate budget for eDemocracy development</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Contain various activities for project management</td>
<td></td>
<td>X</td>
<td>X</td>
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<tr>
<td></td>
<td>Manage the IT investment</td>
<td></td>
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<td>X</td>
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<tr>
<td></td>
<td>Manage quality</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Manage changes</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Manage performance and capacity</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

(continued)
### Table I. Sustainable eDemocracy Development

<table>
<thead>
<tr>
<th>Components</th>
<th>eDemocracy Development Process</th>
<th>Approaches</th>
<th>Black and noble Project route map</th>
<th>eDemocracy positioning</th>
<th>COBIT 4.1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Clift</td>
<td>Project route map</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assess risks</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Manage IT human resources</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Manage problems</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clear communicate among stakeholders</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Monitor and evaluate IT performance</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitor and evaluate internal control</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The environment</td>
<td>Enact the law relating to eDemocracy development and reflecting citizens’ requirements</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Collaborate among government organizations</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Support multiple languages</td>
<td>X</td>
<td>X</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Provide security and privacy</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provide available communication channels</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Support the provision of IT Governance</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The eDemocracy system</td>
<td>Announce the agenda of eDemocracy with details of time and venues to citizens before their participation</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manage service desk for giving suggestion on using eDemocracy system</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manage data to ensure data storage, archive, and transfer</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Define operation management</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
There are four main components, stakeholder and policy, methodology, ICT, and environment, of the sustainable eDemocracy development and one eDemocracy system.

**Stakeholder and policy**

Stakeholders for eDemocracy development are citizens, government, private sectors, non-governmental organizations (NGOs) and political parties. These stakeholders can be both participants and supporters of eDemocracy development. The definition, role, and responsibility of each stakeholder can be identified as follows:

- Citizens refer to ordinary people, immigrants, and people without citizenship. These people have rights and freedom to receive information and services from the government. Moreover, they can participate in expressing opinions on various democratic issues. Therefore, the government should announce eDemocracy development and services to the public so that citizens can participate in these matters. They can help the government by providing eDemocracy requirements from citizens’ view.

- The government is an organization that has power in issuing laws and regulations that are intended to make society acceptable, safe, and prosperous. There are three levels of government: local government, regional government, and national government. Setting the governmental role and responsibility is necessary as it will provide an efficient pathway for eDemocracy development.

- Private sectors refer to private organizations that support and help the government in eDemocracy development by providing resources and/or offering professional advice on eDemocracy development.

- NGOs refer to any non-profit organizations. NGOs can help develop eDemocracy by supporting the government in publicizing and encouraging citizens to express their opinions in the development of eDemocracy.

- Political parties are groups of people with the same ideas and objectives aiming to earn political positions from elections. The main duties of a political party in relation to the democratic process are to represent the citizens in their request for benefits and to persuade them to participate in political activities.
Policy for eDemocracy development involves the regulations written by the government in order to achieve the intended objectives of eDemocracy development. In order to get a well eDemocracy development, there must be a clear policy formation that aims to achieve transparency and openness in government activities. The policy must be in accordance with vision, mission, strategy, and development plan.

**Methodology**

The development methodology is another key component which provides the right direction of eDemocracy development and the guideline for controlling and monitoring the project progress. It contains two important parts: eDemocracy process management and eDemocracy project management:

(1) eDemocracy process management is a kind of methodology that provides a guideline for government to consolidate the process of eDemocracy development. The eDemocracy process management is based on the capability maturity model integration for development (Software Engineering Institute, 2006) and the four domains of process model from COBIT 4.1 (IT Governance Institute, 2007). The capability maturity model integration of eDemocracy development consists of the following stages:

- **Initiate stage.** This stage concerns the feasibility study emphasizing the design and implementation of eDemocracy system in accordance with the citizens’ needs. The development initiation document for development should be established. This document is either a development plan or the setting for development success which will act as the baseline for monitoring the eDemocracy project progress and assessing the eDemocracy project success. Moreover, the identification of role and responsibility of eDemocracy project team are considered.

- **Defined stage.** This stage concerns the clearly defines standard development directions. Personnel involved in the development in the same organization must understand the objectives of eDemocracy development and deployment according to the same standard.

- **Repeatable stage.** This stage involves the development of eDemocracy that has a systematic implementation plan and can be examined with explicit development documents. The development process should be consistent with the time and budget constraints.

- **Quantitatively managed stage.** This stage involves the development of eDemocracy that systematically collects related development documents and conducts an analysis to find the strengths and weaknesses in the eDemocracy development. In addition, there must be an assessment by collecting ideas and comments on the use of the eDemocracy system from citizens.

- **Optimizing stage.** This stage concerns the examining and correcting each development process so that the development is implemented in a continuous way. Moreover, the control of the eDemocracy system to work stably and efficiently and the technical support are also provided to promote the correct use of the eDemocracy system. Furthermore, the training in the use of the developed eDemocracy system will be another support.
eDemocracy project management is established for the purpose of not only delivering the eDemocracy system within defined quality, scope, time, and budget, but also corresponding with the predefined eDemocracy development objectives. Our eDemocracy project management is based on PRojects IN a Controlled Environments introduced by Office of Government Commerce (2006, 2007), UK. EDemocracy project management contains the following phases: starting up, scoping, planning, initiating, directing, controlling, delivering, and closing.

**Information and communication technology**

With the ability of ICT, citizens are able to communicate with each other from anywhere at any convenient time. ICT is widely used and is a possible tool for genuine access to information and participation in the democratic process (Korakas, 2008). The ICT component concerns the consideration of internet technology, mobile and wireless technology, collaboration technology, and enterprise application. Some ICTs which support eDemocracy system are given as follows:

- **Internet technology.** Internet technology permits a borderless communication which can support citizens’ participation worldwide. Citizens can use internet to directly contact with each other. Examples of application that can be used on the internet technology are electronic mails: e-mails and internet relay chat.

- **Mobile and wireless technology.** The mobile and wireless technology refers to the use of mobile to send and receive message. Citizens can participate in the democratic process by sending and receiving text messages through mobile using short messaging service. In addition, by using the multimedia messaging service (Sevanto, 1999), the citizens can participate in the democratic process more efficiently by sending and receiving messages including text, images, audio or video clips, or any combination of these.

- **Collaboration technology.** The collaboration technology refers to the technology that helps citizens participate together. The collaboration technology will widely extend the participation in the democratic process by citizens to local, national, and international level. Examples of collaboration technology are video conference, electronic meeting systems, and the electronic bulletin board.

- **Enterprise application.** The enterprise application is the collection of applications that effectively manage the information by reducing duplicate data storage and transferring data instantly from one system to another. Moreover, the information and services are provided simultaneously on enterprise application. With the qualifications of the enterprise application, the government organization can manage the data related to citizens’ participation more effectively and citizens can access the data quickly.

**Environment**

The environment for eDemocracy development will help improve the development to be more continuous and sustainable. The environment related to eDemocracy development consists of:

- **The standard.** The standard of eDemocracy development is the level of eDemocracy quality or achievement, especially at a level that is thought to be acceptable.
The development standards not only provide quality for eDemocracy development, but also offer the same understanding of each eDemocracy development process amongst the developers.

- **Security and privacy.** The security of information in an eDemocracy system and the protection of the system users’ private information is a factor to be considered in eDemocracy development. Security and privacy helps create reliability and confidence in the developed eDemocracy system.

- **Collaboration.** The collaboration is referred herein in the aspect of the collaboration of government in eDemocracy development which will lead to development of a quality eDemocracy system and create trust among citizens in the use of the developed eDemocracy system. Examples are the collaboration to analyze the needs for development and the management of problems occurred.

- **Quality.** The government must define the quality characteristics of eDemocracy development to establish an eDemocracy system that is in line with the set policy and the needs of citizens who are the users of developed system and receivers of benefits from participation in the democratic process.

- **Globalization.** Globalization is referred herein in terms of language and culture aspects. The language aspect involves the development of eDemocracy system to support multiple languages that enable participation from citizens around the world. The culture aspect concerns demographic, geographic, and psychographic characteristics of citizens who use the eDemocracy system to participate in the democratic process.

- **Ethics.** Since the objective of the developed eDemocracy system is to promote citizens’ participation in the democratic process, the consideration of ethics in citizens’ use of eDemocracy system is also another important issue. Therefore, regulations should be set to ensure that citizens consider the ethical issues when they access the eDemocracy system. This will lead to an orderly use of the system in the participation of democratic process.

**eDemocracy system**

The eDemocracy system is the outcome of eDemocracy development. The system is an automatic tool used to support citizens and related stakeholders in their participation in the democratic process. Three aspects of the eDemocracy system are explained as follows:

1. eDemocracy knowledge is related to information that is the substance of participation in the democratic process. The information must be complete and accurate so that it can immediately respond to citizens’ needs.
2. eDemocracy process is the data management process in the eDemocracy system. The eDemocracy system must store, process, and distribute data efficiently.
3. eDemocracy communication concerns a system that is easy-to-use and is designed to facilitate easy access by all citizens anytime and anyplace. The system must be well designed for the disabled so that they can also participate in the democratic process.
Intrinsic eDemocracy applications

The common principle of democracy is not only concerned with the majority rules but also include the voting, the freedom of liberty, the respect of justice, the promotion of independent judiciary, the support of civil society, and the freedom of discussion and fair comment (Gershman and Allen, 2006; Sen, 1999; United Nation Information Services Vienna, 2001; UNESCO, 1997). The principles of democracy, consists of equality, popular sovereignty, rule of law, majority rules, and liberty (The Inter-Parliamentary Council, 1997; United Nation Information Services Vienna, 2001; Bureau of International Information Programs, 2007). The five intrinsic eDemocracy applications which support these democratic principles are eInformation, eService, eVoting, eComplaint, and eForum. The intrinsic eDemocracy applications with the principle of democracy can be shown in Figure 2.

The descriptions of each application with their supporting of democratic principles are:

- eInformation is the provision of information from government organizations through electronic media such as e-mails and web site. This information is general information from government organizations that needs to be distributed to citizens. The distribution of information can be done instantly, daily, weekly, monthly or annually depending on the policy of each organization. Therefore, the eInformation is related to the equality principle. Citizens have opportunity in receiving information according to their needs anytime and anywhere.

- eService is the provision of government services through electronic media. The services are information or other services apart from general services that are normally provided by government organizations. This form of service will be provided by the government when it is requested by citizens. The examples of eServices are online enrollment and online payments. The eService is related to the equality principle. Citizens can easily request for services according to their needs.

- eVoting is the exercising of voting rights of citizens in a democratic system. The voting does not only include voting according to the specified terms,
but also includes the voting as a part of a public hearing or voting in referenda for issues related to the democratic process, no matter if it is for specified terms or special terms. Since citizens in a democratic country who are eligible voters, or those having ages of 18 years old and higher are under the enforcement of law and sovereign power to elect their administrator, the eVoting application, therefore, is related to both popular sovereignty and the rule of law.

- **eComplaint** is the services for the citizens to make complaints to government organizations. Complaints are sent directly to the related persons in the specific government organization for consideration. Government organizations need to set policies and objectives regarding complaint making so that citizens can properly and conveniently make complaints. Besides, government organizations are able to respond to those complaints in a short time. The eComplaint can be linked to the majority rule principle in which the citizens can use their sovereign power to protest against the falseness of government work and to suggest and complain about political matters.

- **eForum** is the service that provides opportunities in sharing respective political ideas and opinions between government organizations and citizens and among the citizens themselves. The eForum will enhance the process of citizens’ opinion formation through their deliberative engagement (Delakorda, 2006). Ideas are given in a public hearing to gain overall opinions from citizens’ various viewpoints on the issues proposed by either citizens or government organizations. However, those issues must be in line with the policies or objectives of the government organizations. Therefore, the eForum can be linked to the liberty and majority rule principles in which citizens can have freedom to discuss and to show their ideas towards political matters.

### The quality model of eDemocracy system

A citizen-centered approach of eDemocracy quality is defined to achieve the real citizens’ participation. The quality means a degree to which the citizens accept the eDemocracy system. It is a desired issue of eDemocracy system, which is composed of the internal quality and the external quality. The internal quality based on eGovernment web quality assessment model (eGovernment WebQAM) (Wangpipatwong and Chutimaskul, 2005), refers to the desirable feature of eDemocracy system. The external quality adapted from the principles of technology acceptance model (TAM) (Davis, 1989), refers to the acceptance model of eDemocracy system. The internal quality is composed of:

- **Knowledge quality** which refers to the quality of eDemocracy data-information-knowledge. It includes accuracy, timeliness, relevance, precision, and completeness.

- **Process quality** which means the quality of work under an eDemocracy system that can respond to citizens’ needs while participating in the democratic process. This includes functionality, reliability, usability, and efficiency.

- **Communication quality** which refers to the quality of an eDemocracy system that is effectively used by citizens. This includes tangibles, reliability, responsiveness, assurance, and empathy.
The external quality is consisted of two characteristics: perceived ease of use and perceived usefulness for supporting citizens’ needs of and citizens’ acceptance on an eDemocracy system. These internal and external qualities lead to the intention to and the actual use in eDemocracy system. The quality model of eDemocracy system: eDemocracy SQM is shown in Figure 3.

The detail of quality features of eDemocracy system is presented in Table II.

**Conclusion and further work**

This paper addresses the framework for sustainable eDemocracy development, the intrinsic eDemocracy applications, and the quality model of eDemocracy system. The existing eDemocracy development approaches such as the Local eDemocracy project in UK and the COBIT 4.1 offer extensive issues of eDemocracy development. However, they have not yet considered the concepts of the collaboration with other related government organizations and the identification of using eDemocracy system with multiple languages, both of which are also important for development.

This work, therefore, introduces the sustainable eDemocracy development framework consisting of 4 + 1 components which are based on the extension of COBIT 4.1. They are stakeholder and policy, methodology, ICT, environment, and eDemocracy component. Concerning the intrinsic eDemocracy applications, the result from comparison analysis shows that five eDemocracy applications: eInformation, eServices, eComplaint, eForum, and eVoting are the fundamental tools for supporting eDemocracy. To consolidate the framework, the internal and external qualities of eDemocracy are included.

The further work should concentrate on the design of eDemocracy system to be used by all citizens in the country, including those who live in rural areas, or the disabled.

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**Figure 3.**

Quality model of eDemocracy system: eDemocracy SQM
Table II.
Quality features of eDemocracy system

<table>
<thead>
<tr>
<th>Quality aspects</th>
<th>Quality features</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge quality</td>
<td>Accuracy</td>
<td>Information concerning the participation is accurate and is consistent with content and objectives of participation</td>
</tr>
<tr>
<td></td>
<td>Timeliness</td>
<td>Information concerning the participation is announced to citizens on time</td>
</tr>
<tr>
<td></td>
<td>Relevance</td>
<td>Information concerning the participation is consistent with citizens’ needs</td>
</tr>
<tr>
<td></td>
<td>Precision</td>
<td>Information concerning the participation is easy to understand</td>
</tr>
<tr>
<td></td>
<td>Completeness</td>
<td>Information concerning the participation is complete</td>
</tr>
<tr>
<td>Process quality</td>
<td>Functionality</td>
<td>eDemocracy application functions properly and can support each form of participation correctly</td>
</tr>
<tr>
<td></td>
<td>Reliability</td>
<td>eDemocracy application works all the time that citizens need to use it</td>
</tr>
<tr>
<td></td>
<td>Usability</td>
<td>eDemocracy application is not complicated and is easy-to-use</td>
</tr>
<tr>
<td></td>
<td>Efficiency</td>
<td>eDemocracy application can be used effectively by all citizens including the disabled or those who know little about the use of electronic media</td>
</tr>
<tr>
<td>Communication quality</td>
<td>Tangibles</td>
<td>Citizens have many input and output devices for sending and receiving information through eDemocracy application</td>
</tr>
<tr>
<td></td>
<td>Reliability</td>
<td>Citizens rely on eDemocracy application and interest in participation through the eDemocracy application</td>
</tr>
<tr>
<td></td>
<td>Responsiveness</td>
<td>Citizens receive response from government through eDemocracy application in minimal time</td>
</tr>
<tr>
<td></td>
<td>Assurance</td>
<td>Citizens are assured in using eDemocracy application</td>
</tr>
<tr>
<td></td>
<td>Empathy</td>
<td>Citizens fully understand how to use the eDemocracy application</td>
</tr>
</tbody>
</table>

References


IT Governance Institute (2007), *COBIT 4.1*, IT Governance Institute, Rolling Meadows, IL, pp. 1-213.


Corresponding author
Suree Funilkul can be contacted at: suree@sit.kmutt.ac.th